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EXAMINER

NGUYEN, LEON VIET Q

ART UNIT PAPER NUMBER

2611

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

5K

Office Action Summary	Application No. 10/823,308	Applicant(s) DONG-SIK, CHO	
	Examiner Leon-Viet Q. Nguyen	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8/4/05.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-15, 17-20, 23-30 and 32-36 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 10, 16, 21, 22, 25, 31 and 32 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) -
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>5/10/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 5/10/2005 was filed after the mailing date of 5/10/2005. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

1. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

1. Claims 10, 25, and 32 are objected to because of the following informalities:

- a. In claims 10, 25, and 32, "based on the number of change in directions" should read, "based on the number of changes in direction".

Appropriate correction is required.

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claim 32 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 32 pertains solely to stored codes that are not embodied in any computer-readable media.

"Similarly, computer programs claimed as computer listings per se, i.e., the descriptions or expressions of the programs, are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which

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defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32F.3d at 1583-84, 32 USPQ2d at 1035.

See Interim Guidelines on 35 USC 101, Annex IV (a): Functional Descriptive Material.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1, 3, 7, 8, 17, 19, 20, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the background of applicant's specification (hereby referred to as the background) and further in view of Rabinowitz et al (US20030901932).**

Re claim 1, the background teaches a global positioning system (GPS) receiver, comprising:

a converter for converting received GPS signals to in-phase and quadrature-phase digital signals (digital IF in fig. 2);

a correlator (correlator 13 in fig. 2) for generating expected codes and correlating the I and Q digital signals with the expected codes to output sampled I values and sampled Q values for a tap ($\pi/0011$);

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a memory for storing variation data (memory 15 in fig. 2);

a domain transformer for performing domain transform on the variation data to output a transformed value (FFT unit 20 in fig. 2).

The background fails to teach:

a filter for filtering the sampled I values and sampled Q values to modified I values and modified Q values, and for summing the modified I values and modified Q values to output variation data; and

a comparator for comparing the transformed value to a threshold value for determining the presence of a peak at the tap.

Rabinowitz teaches a filter for filtering the sampled I values and sampled Q values to modified I values to each of the modified Q values (LPFs 410I and 410Q in fig. 7), and for summing the modified I values and modified Q values to output variation data (summer 508 in fig. 9);

a comparator for comparing the transformed value to a threshold value for determining the presence of a peak at the tap (comparator 1220 in fig. 12).

Therefore taking the combined teachings of the background and Rabinowitz as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the filter and comparator of Rabinowitz into the GPS receiver of the background. The motivation to combine Rabinowitz and the background would be to recover satellite positioning system aiding information from selected data segments (π 0020).

Re claim 3, the modified invention of the background teaches a receiver wherein the modified I values and modified Q values (the outputs of filters 410I and 410Q in fig. 7 of Rabinowitz) are fractional reductions of respective sampled I values and sampled Q values (Although not explicitly taught, it is well known to one of ordinary skill in the art that signals sent through a low pass filter are reduced by some factor. Therefore the filtered I and Q signals as taught by Rabinowitz are interpreted to be fractionally reduced), the fractional reduction being the same for both the sampled I values and the sampled Q values (LPFs 410I and 410Q in fig. 7 of Rabinowitz are interpreted to be the same, therefore the fractional reduction for both I and Q signals would be the same).

Re claim 7, the modified invention of the background teaches a receiver wherein the domain transformer is a Fast Fourier Transformer (FFT unit 20 in fig. 2 of the background).

Re claim 8, the modified invention of the background teaches a receiver wherein the memory further stores the sampled I and Q values of the tap (memory 15 in fig. 2 of the background storing I and Q values from correlator 13)

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identified as having a peak (¶0091 in Rabinowitz. The correlator output having multiple correlation peaks).

Re claim 17, the limitations have been analyzed and addressed with respect to claim 1. It would be obvious and necessary to have a method of using the GPS receiver as claimed in claim 1. Furthermore, the background teaches receiving GPS signals from a number of GPS satellites (¶0004 in the background).

Re claim 19, the limitations have been analyzed and addressed with respect to claim 3.

Re claim 20, the limitations have been analyzed and addressed with respect to claim 4.

Re claim 23, the limitations have been analyzed and addressed with respect to claim 7.

Re claim 24, the modified invention of the background teaches a method of further including storing in the memory the sampled I and Q values of the tap (memory 15 in fig. 2 of the background storing I and Q values from correlator 13) found to have a peak (¶0091 in Rabinowitz. The correlator output having multiple correlation peaks) and discarding sampled I and Q values of other taps (although not explicitly stated, one of ordinary skill in the art would have found it obvious to discard the unnecessary values).

3. Claims 2 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the background of applicant's specification (hereby referred to as the background) and Rabinowitz et al (US20030901932) and further in view of Woo (US6259401).

Re claim 2, the modified invention of the background fails to teach a receiver wherein the sampled I values and sampled Q values are modified by assigning a positive value to the sampled I value or sampled Q value when a present sample I value or Q value has a different sign from the immediately prior sample I value or sample Q value. However Woo teaches a receiver wherein the sampled I values and sampled Q values (col. 15 lines 15-20) are modified by assigning a positive value to the sampled I value or sampled Q value (col. 15 lines 20-22, the samples are sign adjusted and made positive) when a present sample I value or Q value has a different sign from the immediately prior sample I value or sample Q value (col. 15 lines 15-20).

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Therefore taking the modified teachings of the background and Rabinowitz with Woo as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the sign correcting of Woo into the GPS receiver of the background and Woo. The motivation to combine Woo, Rabinowitz, and the background would be to reduce resolution error in pseudorange tracking (col. 15 lines 11-15).

Re claim 18, the modified invention of the background fails to teach a receiver wherein the sampled I values and sampled Q values are modified by assigning a negative value to the sampled I value or sampled Q value when a present sample I value or Q value has a different sign from the immediately prior sample I value or sample Q value. However Woo teaches a receiver wherein the sampled I values and sampled Q values (col. 15 lines 15-20) are modified by assigning a negative value to the sampled I value or sampled Q value (col. 15 lines 20-22. The samples being sign adjusted is interpreted to mean the signs of the samples are switched. Therefore the positive I and Q samples would be switched to negative I and Q samples) when a present sample I value or Q value has a different sign from the immediately prior sample I value or sample Q value (col. 15 lines 15-20).

Therefore taking the modified teachings of the background and Rabinowitz with Woo as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the sign correcting of Woo into the GPS receiver of the background and Woo. The motivation to combine Woo,

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Rabinowitz, and the background would be to reduce resolution error in pseudorange tracking (col. 15 lines 11-15).

4. Claims 4 rejected under 35 U.S.C. 103(a) as being unpatentable over the background of applicant's specification (hereby referred to as the background) and Rabinowitz et al (US20030901932) and further in view of Fullerton et al (US5963581).

Re claim 4, the modified invention of the background fails to teach a receiver wherein the fractional reduction is one half. However Fullerton teaches teach a receiver including a filter wherein the fractional reduction is one half (col. 21 lines 14-17).

Therefore taking the modified teachings of the background and Rabinowitz with Fullerton as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the filter of Fullerton into the GPS receiver of the background and Woo. The motivation to combine Fullerton, Rabinowitz, and the background would be to maximize the signal-to-noise ratio of a data stream (col. 21 lines 13-14).

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over the background of applicant's specification (hereby referred to as the background) and Rabinowitz et al (US20030901932) and further in view of Lennen (US6888879).

Re claim 9, the modified invention of the background fails to teach a

receiver wherein the memory is one of a SRAM or a DRAM. However Lennen teaches using SRAM or DRAM physical memory (col. 11 lines 35-41).

Therefore taking the modified teachings of the background and Rabinowitz with Lennen as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the SRAM or DRAM of Lennen into the GPS receiver of the background and Rabinowitz. The motivation to combine Lennen, Rabinowitz, and the background would be to allow higher clock rates (col. 11 lines 38-39) or use less surface area in an integrated circuit (col. 11 lines 39-40).

6. Claims 10, 11, 13, 25, 26, 28, 30, 32, 33, 35, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over the background of applicant's specification (hereby referred to as the background) and in view of Rabinowitz et al (US20030901932) and further in view of Humphreys et al (US5793825).

Re claim 10, the background teaches a global positioning system (GPS) receiver, comprising:

a converter for converting received GPS signals of a tap to in-phase and quadrature-phase digital signals (digital IF in fig. 2);

a correlator (correlator 13 in fig. 2) for correlating the I and Q digital signals with expected codes to output sampled I values and sampled Q values (¶0011), each of the sampled I values and sampled Q values having a sign bit for

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signifying direction (although not explicitly stated, it is well known in the art that signals are transmitted with a sign or significant bit); and

a domain transformer for performing domain transform on data derived from the sampled I values and sampled Q values of the tap (FFT unit 20 in fig. 2) and outputting a transformed value (the output of FFT unit 20 in fig. 2); and

The background fails to teach:

a filter for filtering at least the sign bits of the sampled I values and sampled Q values and determining whether a potential peak exists at the tap based on the number of change in directions in the sign bits of the sampled I values and sampled Q values; and

a comparator for comparing the transformed value to a threshold value for determining the presence of a peak at the tap.

Rabinowitz teaches a filter for filtering the sampled I values and sampled Q values to modified I values to each of the modified Q values (LPFs 410I and 410Q in fig. 7), and for summing the modified I values and modified Q values to output variation data (summer 508 in fig. 9);

a comparator for comparing the transformed value to a threshold value for determining the presence of a peak at the tap (comparator 1220 in fig. 12).

Therefore taking the combined teachings of the background and Rabinowitz as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the filter and comparator of Rabinowitz into the GPS receiver of the background. The motivation to combine

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Rabinowitz and the background would be to recover satellite positioning system aiding information from selected data segments (§0020).

Humphreys teaches determining whether a potential peak exists at the tap (col. 6 lines 58-60, the falling edge is interpreted to signify a peak) based on the number of change in directions in the sign bits of the sampled I values and sampled Q values (col. 6 lines 54-58. How many transitions of a predetermined direction is interpreted to be the number of changes in direction. The significant bit is determined to be the sign bit. The reference signal is interpreted to be the sampled I and Q values).

Therefore taking the combined teachings of the background, Rabinowitz and Humphrey as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the peak detection of Humphreys into the GPS receiver of the background and Rabinowitz. The motivation to combine Humphreys, Rabinowitz and the background would be to account for cases the frequency of a generated signal is excessively fast (col. 6 lines 62-63).

Re claim 11, the modified invention of the background teaches a method of further including a memory for storing the data derived from the sampled I and Q values of the tap (memory 15 in fig. 2 of the background storing I and Q values

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from correlator 13) determined to have a potential peak (¶0091 in Rabinowitz.

The correlator output having multiple correlation peaks).

Re claim 13, the modified invention of the background teaches a receiver wherein the data is derived from the sampled I values and sampled Q values by adding sign-modified I values to sign-modified Q values (the output of summer 508 in fig. 9 of Rabinowitz).

Re claim 25, the limitations have been analyzed and addressed with respect to claim 10. It would be obvious and necessary to have a method of using the GPS receiver as claimed in claim 10.

Re claim 26, the limitations have been analyzed and addressed with respect to claim 11.

Re claim 28, the limitations have been analyzed and addressed with respect to claim 13.

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Re claim 30, the modified invention of the background teaches a method wherein the filtered I values and filtered Q values (the outputs of filters 410I and 410Q in fig. 7 of Rabinowitz) are fractional reductions of respective sampled I values and sampled Q values (Although not explicitly taught, it is well known to one of ordinary skill in the art that signals sent through a low pass filter are reduced by some factor. Therefore the filtered I and Q signals as taught by Rabinowitz are interpreted to be fractionally reduced), the fractional reduction being the same for both the sampled I values and the sampled Q values (LPFs 410I and 410Q in fig. 7 of Rabinowitz are interpreted to be the same, therefore the fractional reduction for both I and Q signals would be the same).

Re claim 32, the limitations have been analyzed and addressed with respect to claim 10. It would be obvious and necessary to have a stored program device having stored codes to perform the method of using the GPS receiver as claimed in claim 10.

Re claim 33, the limitations have been analyzed and addressed with respect to claim 11.

Re claim 35, the limitations have been analyzed and addressed with respect to claim 13.

Re claim 36, the modified invention of the background teaches a stored program device wherein the stored program device is one of a flash memory or ROM (§0140 in Rabinowitz).

7. Claims 12, 27, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over the background of applicant's specification (hereby referred to as the background), Rabinowitz et al (US20030901932), and Humphreys et al (US5793825) and further in view of Lennen (US6888879).

Re claim 12, the modified invention of the background fails to teach a receiver wherein the memory is one of a SRAM or a DRAM. However Lennen teaches using SRAM or DRAM physical memory (col. 11 lines 35-41).

Therefore taking the modified teachings of the background, Rabinowitz, and Humphreys with Lennen as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the SRAM or DRAM of Lennen into the GPS receiver of the background, Humphreys and Rabinowitz. The motivation to combine Lennen, Humphreys, Rabinowitz, and the background would be to allow higher clock rates (col. 11 lines 38-39) or use less surface area in an integrated circuit (col. 11 lines 39-40).

Re claim 27, the limitations have been analyzed and addressed with respect to claim 12.

Re claim 34, the limitations have been analyzed and addressed with respect to claim 12.

8. Claims 14, 15, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the background of applicant's specification (hereby referred to as the background), Rabinowitz et al (US20030901932), and Humphreys et al (US5793825) and further in view of Woo (US6259401).

Re claim 14, the modified invention of the background fails to teach a receiver wherein the sampled I values and sampled Q values are modified by assigning a positive value to the sampled I value or sampled Q value when a present sample I value or Q value has a different sign from the immediately prior sample I value or sample Q value. However Woo teaches a receiver wherein the sampled I values and sampled Q values (col. 15 lines 15-20) are modified by assigning a positive value to the sampled I value or sampled Q value (col. 15 lines 20-22, the samples are sign adjusted and made positive) when a present sample I value or Q value has a different sign from the immediately prior sample I value or sample Q value (col. 15 lines 15-20).

Therefore taking the modified teachings of the background, Humphreys and Rabinowitz with Woo as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the sign

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correcting of Woo into the GPS receiver of the background, Humphreys and Rabinowitz. The motivation to combine Woo, Humphreys, Rabinowitz, and the background would be to reduce resolution error in pseudorange tracking (col. 15 lines 11-15).

Re claim 15, the modified invention of the background teaches a receiver wherein the modified I values and modified Q values (the outputs of filters 410I and 410Q in fig. 7 of Rabinowitz) are fractional reductions of respective sampled I values and sampled Q values (Although not explicitly taught, it is well known to one of ordinary skill in the art that signals sent through a low pass filter are reduced by some factor. Therefore the filtered I and Q signals as taught by Rabinowitz are interpreted to be fractionally reduced), the fractional reduction being the same for both the sampled I values and the sampled Q values (LPFs 410I and 410Q in fig. 7 of Rabinowitz are interpreted to be the same, therefore the fractional reduction for both I and Q signals would be the same).

Re claim 29, the limitations have been analyzed and addressed with respect to claim 14.

Allowable Subject Matter

9. Claims 5-6, 16, 21-22, and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

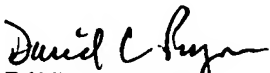
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon-Viet Q. Nguyen whose telephone number is 571-270-1185. The examiner can normally be reached on monday-friday, alternate friday off, 7:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leon-Viet Nguyen/


DAVID C. PAYNE
SUPERVISORY PATENT EXAMINER